

# TACIT KNOWING AND TACIT KNOWLEDGE FROM AN EVOLUTIONARY POINT OF VIEW

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## ABSTRACT

The theory of tacit knowing plays a key role in the philosophy of Michael Polanyi, nevertheless it is not true that Polanyi deduces his theory of tacit knowledge from that. Tacit knowing is merely an example—but it is a very important example—of the working of tacit knowledge. So, our knowing is tacit because it is necessarily based on the previous tacit elements of our emergent hierarchy of knowledge. At the same time, if we accept, as Polanyi does, contrary to the commitments of modern philosophy, that the process of knowing is a social evolutionary development we can establish that our tacit knowing and knowledge are inseparably interwoven.

**Keywords:** tacit knowing, tacit knowledge, emergence, evolutionary epistemology, ontology, skills.

## INTRODUCTION

The theory of tacit knowing plays a key role in the philosophy of Michael Polanyi. The reason of this is twofold. Firstly, epistemology has already been in the focus of modern philosophy since Francis Bacon, and one of the fundamental goals of Polanyi's post-critical philosophy is the rethinking of modern epistemology. Secondly, tacit knowing may be Polanyi's most important example for the working of tacit knowledge.

Many who study Polanyi's philosophy, according to the commitments of modern philosophy, deal with his epistemology and lose his real goal; because Polanyi's primary intention is to talk about the *tacit* dimension and our personal *knowledge*. They assert that Polanyi's theory of tacit knowledge follows definitely from his epistemology, for example, as an aspect of his theory of tacit knowing. Contrary to this, I think that tacit knowing is merely Polanyi's most important example for the workings of our tacit knowledge, thus tacit knowledge *cannot* be derived from tacit knowing.

If the theory of tacit knowledge followed from the theory of tacit knowing, then this would mean that Polanyi's ontology follows from his epistemology. The situation,

however, is *much more complicated*. It is true that in Polanyi's philosophy there are no objective and necessary ontological categories, but this is not the consequence of the diversity of individual (or social) knowing, but of the *evolution* of tacit knowledge. Strictly speaking, it is not true that our whole knowledge follows from tacit knowing. The tacit dimension is *more* than knowing. Polanyi's theory of tacit knowing was based on individual perception and Gestalt psychology. Comprehensive ontological categories, which are more than subjective (e.g. personal), could not follow from knowing *but only from* the evolutionary emergence of tacit knowledge. However, this process of the emergence of knowledge can only be interpreted as a kind of evolutionary epistemology and at the cultural level as a kind of social or collective epistemology. So, the tacit dimension of our knowledge is more than the individual component of knowing. It is the consequence of the comprehensive evolutionary emergence of tacit knowledge.

In my paper I will investigate the relationship between tacit knowing and tacit knowledge and establish the differences. Then, I will attempt to offer an interpretation of the evolution of tacit knowledge as the Janus faces of knowing and being. In section 1 I will investigate the structure of tacit knowing, then in section 2 the structure of skills. We will see that the two structures are the same, so, because skills are not knowing, this specific tacit structures follow from an independent common source and not from the epistemology of tacit knowing. In section 3 I will investigate the source, the ontology of the emergent structure of tacit knowledge, and finally in section 4 I will give an interpretation of knowing, to sketch the specific Polanyian relationship between knowing and being from an evolutionary point of view.

## 1. THE STRUCTURE OF TACIT KNOWING

Whenever we are focusing our attention on a particular object, we are relying for doing so on our awareness of many things to which we are not attending directly at the moment, but which are yet functioning as compelling clues for the way the object of our attention will appear to our senses. (Polanyi 1969c:113)

So, according to Polanyi, our cognition is directed by such "compelling *clues*" in the background, which although we are not attending to them (*subsidiary* awareness) still specify the object of our cognition (*focal* awareness). Clearly, the subsidiary and the focal awareness are not two levels but two different kinds of awareness. There is no focal awareness without subsidiary awareness, and in the same way, there is no subsidiary awareness without focal awareness. Though the subsidiary awareness determines the focal awareness still it is meaningless in itself, because it can manifest itself *only via* focal awareness. It follows that our cognition becomes necessarily *tacit*, since we are aware of the determining clues only in a subsidiary way.

To illustrate this with an example of Polanyi: the Danube, as a clue in the background, indicates to us that we sense ourselves moving on an *immobile* bridge; yet if we raise our head, thereby putting the Danube in the focus of our attention, then we do not sense *ourselves* moving but, instead, the Danube, which is, in turn, determined as a percept by the clues of the existence of riverbanks in the background (Polanyi 1969c:111).

From this example it follows that a thing that functions as a clue in another time and situation can be put *in the focus* of our attention, thus it can be explicable as well. This means that a subsidiary item is inexplicable (that is, tacit), because our knowing has such a kind of (focal-subsidary) structure that every item becomes necessarily tacit in the subsidiary position and *not* because an actually subsidiary item is tacit *in itself*. An actually subsidiary item in another cognition as a *focal* item *can be* wholly explicable as well.

In the same way, it does not follow from the tacit structure of knowing that the focal items are necessarily wholly explicable. It is only a *possibility*.

So, although it is true that many times Polanyi introduces the concept of tacitness via his theory of tacit knowing, and that this is also his fundamental example for the working of tacit knowledge, still, the subsidiary items are tacit only because they cannot be explicable for the given observer and not because they necessarily cannot be explicable for someone else or in another situation. It follows that, from the tacit structure of knowing one cannot conclude the nature of our knowledge concerning the subsidiary items, that is, if our knowledge of the subsidiary items is tacit in itself or not. One can only conclude that these items function as tacit clues *in this* knowing process, and because in every human knowing act are such kinds of subsidiary items necessarily every human knowing act is tacit. Thus from the tacit triad (Polanyi 1968:30) the *integration* of subsidiary items to focal object plays the key role. Our knowing is tacit because its *integration process* is tacit; there are always determining subsidiary clues; but from this specific structure it does *not* follow what nature the focal and subsidiary items in themselves have.

So, in Polanyi's view, the structure of our knowing can be depicted in the following way: subsidiary items → tacit integration → focal object.

The concept of tacit does not equal the concept of subsidiary. The tacit means *more*. According to this idea, one has necessarily tacit knowledge concerning the subsidiary items only in the *actual* knowing act but the integration process is *always* tacit *in every* knowing act. Strictly speaking, while a subsidiary item can be explicable in another knowing act as a focal object, our tacit integration process of knowing can never be replaced with something else. That is possible only in the case of the ideal knowledge possessed by Laplace's demon, because his knowing process is wholly explicable, that is, *deductive*, free from the necessarily tacit integration process of our knowing.

This difference between a deduction and integration lies in the fact that deduction connects two focal items, the premises and consequents, while integration makes subsidiaries bear on focus. (Polanyi 1968:32)

Laplace's demon simply does *not* have the same tacit structure of knowing as we do. His structure of knowing is the following: focal object → explicit deduction → focal object.

The core of the Polanyian criticism is that this ideal structure of knowing is not true and cannot be true for the structure of human knowing as it was supposed by modern Western philosophy. The modern critical Western philosophy shook logically determined foundations for knowing, however, from an evolutionary point of view the biological and cultural determinants cannot be eliminated for an ideal, wholly explicit structure of knowing because they are the foundations of knowing (section 4). So, when, for example, a neurologist depicts our tacit knowing by explicit mechanical steps in a Laplacian way she makes a "deceptive substitution" (Polanyi 1962:141) and necessarily speaks about something else, the physical conditions of our knowing and not about our real knowing act (Polanyi 1968:39).

So, one cannot conclude the tacit nature of our knowledge from the tacit structure of our knowing. This is not the reason why Polanyi states that our knowledge is also as tacit as our knowing. Logically it is possible to conceive such a kind of demon who although possesses *only explicit knowledge items*, still his knowing process is not deductive as that of Laplace's demon but he integrates his knowledge items in exactly the same tacit way as humans do. This can be depicted in the following way: focal object → tacit integration → focal object. From the tacit structure of knowing tacit knowledge does *not* follow.

## 2. THE STRUCTURE OF SKILL-TYPE KNOWLEDGE

If I know how to ride a bicycle or how to swim, this does not mean that I can tell how I manage to keep my balance on a bicycle or keep afloat when swimming. I may not have the slightest idea of how I do this or even an entirely wrong or grossly imperfect idea of it, and yet go on cycling or swimming merrily. Nor can it be said that I know how to bicycle or swim and yet do *not* know how to coordinate the complex pattern of muscular acts by which I do my cycling or swimming. I both know how to carry out these performances as a whole and also know how to carry out the elementary acts which constitute them, though I cannot tell what these acts are. This is due to the fact that I am only subsidiarily aware of these things, and our subsidiary awareness of a thing may not suffice to make it identifiable. (Polanyi 1969d:141-2)

I think Polanyi's example is quite clear. When someone rides a bicycle or swims she is aware of the components of action of which the bicycle riding or the swimming

consists only *subsidiarily*. From these subsidiary parts by an *integration process* the *focal whole*, that is, the bicycle riding or the swimming itself come into being. The integration process cannot be wholly explicated. It is *tacit*. So, in Polanyi's view, the structure of skill-type knowledge can be depicted in the following way: subsidiary items → tacit integration → focal object. It is the same structure as in the case of tacit knowing.

Naturally, one can try to make the process of bicycle riding or swimming explicit, e.g. using the Newtonian equations, but that will end in total failure, hence: "Such knowledge is ineffectual, unless known tacitly." (Polanyi 1969d:144) Contrary to tacit knowing, in the case of skills-type knowledge the subsidiary parts of the integration process are tacit not only because they are in the subsidiary position of the integration process, since if one put them into the focus of attention they would still remain partly tacit—as the case is in the balancing process. These subsidiary parts are such kind of *knowledge items*, namely how one pushes down on the pedals, holds the handle-bars, keeps the balance, etc., which as personal facts are tacit *in themselves*. So, in the case of skill-type knowledge besides the tacit integration process there are necessarily such kinds of tacit knowledge items, which are also tacit in nature. It follows that in this case conceiving a kind of demon who has explicit acting power is *not* possible. Explicit biking is beyond reason (Héder, Paksi 2012).

So, the structures of the skill-type knowledge and tacit knowing (subsidiary items → tacit integration → focal object) are exactly the *same*. Moreover, Polanyi asserts that face recognizing (Polanyi 1969d:142), scientific intuition (Polanyi 1969c:118), physiognomy (Polanyi 1969a:123), simple perception and tool using (Polanyi 1969a:127), as well as the understanding of words or a text have all the same structure (Polanyi 1975:70-5). One can understand the meaning of a sentence only if a person focuses her attention at the focal whole and if she is aware of the words from which the focal whole emerges by tacit integration only subsidiarily. Once an expert lector's attention is focused on the parts, e.g. on the letters, the words, and the spelling mistakes, then she loses the meaning of the whole text. The close connection among the different activities and the processes of knowing were also emphasized by Polanyi himself.

The structural kinship of the arts of knowing and doing is indeed such that they are rarely exercised in isolation; we usually meet a blend of the two. (Polanyi 1969a:126)

For now, let us not ask why knowing and skill-type knowledge are so closely connected (section 3), but let us concentrate on the fact that significantly *different* activities have the very *same* tacit structure. It is clear that bicycle riding or swimming is *not* knowing. It follows that if they had the same structure as knowing, this tacit structure would not stem from the structure of knowing. Rather (and this is my point) these two different activities have the same structure because there is an *independent, common cause that determines both*.

So, the question is: which is necessarily common both in the cases of knowing and skill-type knowledge? The focal and subsidiary items, as we have seen, can be different (tacit or focal) but the integration cannot. This necessarily tacit integration determines the same structures of knowing and skill-type knowledge. It follows, and this is important, that the structure of skill-type knowledge is not rooted in epistemology of tacit knowing. Neither is the tacit structure of knowing. Now, the question is what the origin of the structure of tacit integration is which determines all of the structures of these different activities.

### 3. THE STRUCTURE OF TACIT KNOWLEDGE: THE ORIGIN OF TACIT INTEGRATION

Searching for the origin of tacit integration it may be worth calling again Laplace's demon because, in several Polanyian examples, he plays the ideal "knower" of modern philosophy. As we have seen in the previous sections, the structure of tacit integration determines both our knowing and skill-type knowledge; however, it does not bear on the knowing of the Laplacean demon. The question is: why?

First of all, the Laplacean demon is *not* a person but a *bodiless intelligence* who knows all the fundamental physical laws. His perception has no limits and he can explicitly describe the entire fundamental physical universe at a given moment. From these explicitly detailed data he can conclude the actual state of the entire fundamental physical universe of any moment. From the point of view of modern philosophy concerning ideal knowledge the demon knows everything and his knowledge is wholly explicit.

Polanyi, however, denies that Laplace's demon knows everything (Polanyi 1959:48-9). For example, in contrast to us, Laplace's demon does not possess skill-type knowledge. This is the reason why his perception has no limits and is instantaneous. Contrary to this, our simple perception is based on such kinds of limited, subsidiary skills as e.g. the eye-moving (Polanyi 1997a:252). Moreover, according to Polanyi, the scientific intuition that fundamentally determines the scientific knowing is also a kind of limited, subsidiary skill (Polanyi 1969c:118).

So, human knowing, contrary to that of the non-personal Laplace's demon, is *based on skill-type knowledge*. The skill-type knowledge is necessarily tacit in nature. The subsidiary knowledge items from which the tacit integration creates the skill-type activities such as bicycle riding, swimming, simple perception, etc. cannot be wholly explicable.

As we have seen in section 1, logically it is possible to conceive a kind of demon who although possesses *only explicit knowledge* still his knowing process is not as deductive as that of Laplace's demon but it integrates its knowledge items exactly in the same tacit way as we do (focal object → tacit integration → focal object). Only from the tacit structure of knowing, tacit knowledge does not follow. Of course, the reason why our knowing is tacit, contrary to that of Laplace's demon, is not this

logical possibility but the fact that our knowing is based on skills, that is, on such subsidiary knowledge items, which are necessarily tacit in themselves by their very nature. It follows on the one hand, that tacit integration is not tacit by itself (e.g. in the case of my demon) but because of the necessarily tacit subsidiary knowledge items on which it relies, and on the other hand, that it is definitely the structure of our *skill-type knowledge* (subsidiary items → tacit integration → focal object) that determines the structure of our knowing and not vice versa.

Now, the questions are why these subsidiary knowledge items cannot be wholly explicable, and, why our skill-type knowledge, which determines our knowing is tacit. The Polanyian answer is that these subsidiary knowledge items are not and cannot be parts of our whole explicit knowledge, thus, they cannot be wholly explicable: they are tacit *in nature*. (Remember, the neurologist explicit Laplacian knowledge of our knowledge is not the same!) However, only wholly explicit knowledge about the world can be possessed by Laplace's demon. It follows that Laplace's demon is *not aware of* any of the subsidiary knowledge items in any way and *cannot be aware of* them or otherwise his knowing could *not* be wholly explicable and he could *not* possess the whole possible explicit knowledge about the world.

Polanyi describes this in the following way:

Assume, for the sake of argument, that we possess a complete atomic theory of inanimate matter. We can then envisage the operations of a Universal Mind in the sense of Laplace. The initial positions and velocities of all the atoms of the world being given for one moment of time, and all the forces acting between the atoms being known, the Laplacean Mind could compute all future configurations of all atoms throughout the world, and from this result we could read off the exact physical and chemical typography of the world at any future point of time. But we now know that there is a great and varied class of objects which cannot be identified, and still less understood, by establishing their complete physical and chemical topography, for they are constructed with a view to a purpose which physics and chemistry cannot define. So it follows that the Laplacean Mind would be subject to the same limitation: it could not identify any machine nor tell us how it works. Indeed, the Laplacean Mind could identify no object or process, the meaning of which consists in serving purpose. It would ignore therefore the existence not only of machines but also of any kind of tools, foodstuffs, houses, roads and any written records or spoken messages. (Polanyi 1959:48-9) ...a complete 'Democritean' or Laplacian knowledge can tell us nothing without relying on our personal [and tacit] knowledge of these comprehensive features. (Polanyi 1962:358)

Polanyi definitely denies the modern positivist notion that human knowledge can be made wholly explicable and asserts that, according to the different nature of reality, two different kinds of human knowledge exist in the *ontological* sense: *tacit* and *explicit*. The Laplacean demon *cannot* recognize any comprehensive entity in the world because it possesses *merely* explicit initial knowledge, thus his further

knowing is also limited to the wholly explicit universe of fundamental physics. His knowing starts from the knowledge of the laws and actual state of the fundamental physical entities (this is his initial knowledge). The reason why this is wholly explicable is that the object of his knowing activity is also the always explicable fundamental physical substance. His knowing process can be depicted in the following way: explicit initial knowledge of explicable physical substance → explicit deduction → new explicit knowledge of explicable physical substance.

Contrary to this, our knowledge is based on such kinds of tacit knowledge items (this is our initial knowledge) and by their tacit integration, we can *also* recognize complex, comprehensive, *emergent* entities, which cannot be wholly explicable. This can be depicted in the following way: tacit previous knowledge → tacit integration → tacit, personal knowledge of emergent reality.

In the above quotation Polanyi mentions machines and tools as examples for these kinds of comprehensive, emergent entities. Nevertheless, living organisms as “machine type” entities are *also* comprehensive, emergent entities (Polanyi 1969b; 1997b). Naturally, the same is also true for the human body and its organs too, that determine our knowing. Thus our knowing, as I argued above, has to be necessarily tacit according to these skill-type, tacit knowledge items such as eye-movement, body control, etc. Our initial tacit knowledge, however, consists not only of these skills-type knowledge items, according to which we recognize a frog as a frog, but e.g. of the knowledge of the emergent characteristics of the frog, that it is green, it croaks, etc. So, after all, this initial tacit knowledge is the very source of the tacit structure of our knowing, that is, it is rooted in the tacit foundations of the hierarchy of our knowledge, and not in the simple fact that it is determined by subsidiary clues.

One can establish now that our tacit knowledge is *primary* to our tacit knowing and that it has *ontological* characteristics. However, this does not mean that our tacit knowledge possesses some kind of explicit, objective reality as it is in the case of the substantial physical entities but possesses a kind of personal, emergent reality according to Polanyi’s entirely new definition of reality.<sup>1</sup> For example:

Real is that which is expected to reveal itself indeterminately in the future. [...] This conception of reality and of the tacit knowing of reality underlies all my writings.” (Polanyi 1964:10) Or: “...man has the power to establish real patterns in nature, the reality of which is manifested by the fact that their future implications extend indefinitely beyond the experience which they were originally known to control. (Polanyi 1962:37)

So, our knowing possesses ontological characteristics (Polanyi 1969d:141; 1967:13) not by itself but by *the tacit foundation of our knowledge*. But, of course, our knowing relied on this tacit foundations can lead us up into the levels of explicit knowledge. This means that *there is no* explicit knowledge without tacit knowledge. Tacit

<sup>1</sup> I investigated Polanyi’s theory of emergence and its reality in other papers (Paksi 2010b; 2011).

knowledge, however, *can exist* without explicit knowledge, and we can already find this in animals<sup>2</sup> (Polanyi 1962:71-7). The hierarchical structure of our knowledge fundamentally consists of these two different kinds of knowledge (tacit knowledge → explicit knowledge).

While tacit knowledge can be possessed by itself, explicit knowledge must rely on being tacitly understood and applied. Hence all knowledge is *either tacit or rooted in tacit knowledge*. A *wholly* explicit knowledge is unthinkable. (Polanyi 1969d:144)

These hierarchical tacit foundations of our knowledge are the reason why we can surpass the level of the explicit knowledge of Laplace's demon and can recognize such kinds of comprehensive, multileveled emergent entities as machines, tools, and living beings. For Polanyi this is a great achievement of meaningful life (biology) and the Laplacean demon is only a deceptive logical illusion of modern Western philosophy, which tries to reduce our knowledge into the meaningless territory of matter (physics).

The fact that in Polanyi's view the hierarchical structure of our knowledge has two fundamental emergent levels (tacit and explicit) does not mean that inside the fundamental levels one could not identify further hierarchical sublevels. According to the structure of tacit integration, for example, bicycle riding consists of at least two different hierarchical sublevels; one of them is the sublevel of such different, independent muscle-coordinating further subsystems like the pushing of the pedals, holding of the handle-bars, keeping the balance, etc., and the other is the sublevel of the integrated tacit activity, that is, the sublevel of bicycle riding itself. So, skill-type knowledge is a typical case of multileveled, tacit knowledge, which consists of different integrated, lower level knowledge items. Polanyi's most detailed example for the tacit integration of multileveled knowledge items is speech. The hierarchical structure of speech consists of five emergent sublevels building onto each other. These levels are the following:

...the production (1) of voice, (2) of words, (3) of sentences, (4) of style, and (5) of literary composition. Each of these levels is subject to its own laws, as prescribed (1) by phonetics, (2) by lexicography, (3) by grammar, (4) by stylistics, and (5) literary criticism. These levels form a hierarchy of comprehensive entities, for the principles of each level operate under the control of the next higher level. (Polanyi 1967:35-6)

There is another aspect in this example that can be interesting for us, since one can recognize the gradual surpassing of the tacit level of our hierarchy of knowledge. According to this, the first sublevel of speech, that is, the production of voice, is a

<sup>2</sup> Or more exactly, in all living beings, because "*knowing belongs to the class of achievements that are comprised by all forms of living*" (Polanyi 1962:403).

barely explicable, skill-type tacit knowledge like bicycle riding while the last, the production of literary composition is a mostly explicable one. An explicit text, for example, an important law of the legal system is such kind of explicit sublevel of our hierarchy of knowledge which, on the one hand, significantly determines our everyday life (that is, our lower level, mostly tacit activities like, e.g., bicycle riding if the text in question is the Highway Code). However, on the other hand, the text's interpretation and application are always rooted in these lower level tacit sublevels. Nevertheless, this does not mean that an explicit text such as an important law of the legal system is not a real emergent entity at the higher explicit levels of our hierarchy of knowledge.<sup>3</sup>

#### 4. KNOWING AND BEING

We have seen that previous tacit knowledge makes the process of tacit knowing possible. This previous tacit knowledge determines, on the one hand, the fundamental structure of tacit knowing, which leads to the tacit integration of comprehensive emergent entities, and, on the other hand, the emergent hierarchy of our being. Since our emergent being is nothing else but the continuous activities of the levels of the hierarchy of our knowledge, as we ride a bicycle, swim, talk, follow the rules and laws, or get to know something, etc.

Nevertheless, tacit knowledge is primary to tacit knowing *only if* one speaks about unambiguously individual knowing, according to the commitments of modern Western philosophy. In this case a knowing activity of a scientist is determined by several tacit knowledge items.

(1) A significant part of these items is tacit because in the actual knowing process the scientist is aware of them only subsidiarily. Expressed in a Kuhnian way, this part of these items consists of the first two, mostly explicit elements of the disciplinary matrix, 'symbolic generalizations' and 'metaphysical paradigms', that is, of the scientific theories (Kuhn 1996:182-7).

<sup>3</sup> This might be worded in the following way. Explicit knowledge exists at higher cultural levels above the level of the pure individual minds in accordance with his own higher-level principles. To illustrate this, here is an example: due to this autonomous existence, using some newly excavated written memories of a long forgotten and vanished people, a historian can reconstruct the mostly lower level, significant parts of the culture, language, and life of the people who at one time led to the drafting of that once vanished and now excavated explicit written memories. This would not be possible if the higher level had been vanished forever and had lost its autonomous existence when the lower levels vanished, which provided the necessary preconditions of its drafting. Nevertheless the uncovering of the culture of the long forgotten and vanished people cannot be completed in this way because the culture and knowledge of a people is in part necessarily tacit. (At the same time, the excavation of the material memories could deepen the understanding of the culture of long forgotten people.)

(2) Another important part of these items exists at those cultural levels of the hierarchy of our knowledge where explicit and tacit knowledge items are interwoven as deeply as we have seen that in the case of speech. The working scientist may not be aware of this part of his knowledge at all. Expressed in a Kuhnian way, this other part of these items consists of the third (values) and forth (exemplars) elements of the disciplinary matrix (Kuhn 1996:182-7). Polanyi himself describes these knowledge items as *personal commitments* of the scientists to certain scientific values and methods that underlie and determine their scientific activity. These commitments and other knowledge items are manifested at the cultural level of the scientist's community in the different scientific institutions and scientific activities, that is, in the *conviviality* of the scientific community.

(3) Another significant part of these items is rooted in deep, biological levels and cannot be explicable, as we have seen in the example of bicycle riding in section 2 (Polanyi 1962: e.g. 69-132). This part has no equivalent in Kuhnian terms.

These different types of tacit knowledge items are primary to tacit knowing *only if* one speaks about merely *individual* knowing. Polanyi speaks about tacit knowing in this way when he uses it as an example for the functioning of tacit knowledge and he also speaks about tacit knowing in this way when he wants to show that individual knowing has a tacit structure in itself, contrary to positivist conception of knowledge. But when he wants to show how these tacit knowledge items are formed during our intellectual life and in the process of socialization when they pass from one generation to another he never speaks about this individual kind of knowing but about a *common, culturally sustained* process of knowing embedded in human *conviviality* (Polanyi 1962:203-11). In this sense he says, "knowledge is an activity which would be better described as a process of knowing" (Polanyi 1969a:132).

Here, knowing is not an idealized individual activity but first of all a *learning* process, which has another necessary precondition beyond the knowing person, that is, the accepted *authority*. According to this, the foundation of knowing in Polanyi's view is not a mechanical, rational scientific process but *trust*, which was formed by the *conviviality* of generations.

The current cultivation of thought in society depends throughout on the same kind of personal confidence which secures the transmission of social lore from one generation to the next. (Polanyi 1962:208)

For Polanyi the acquisition of the most simple behaviors, of more complex skills, and of the higher level scientific knowledge also follows this pattern. According to one of his favorite examples from his personal life, a medical student learns the list of symptoms of different diseases from medical textbooks but only during her medical practice will she be able to acquire the knowledge of how to get well-established diagnoses, according to the observed symptoms (Polanyi 1969a:125). Here, there is not merely a tacit integration of an individual knowing but a working

of a complex, cultural hierarchy of knowledge. The medical student has to show trust in different, higher-level scientific (e.g. university) and cultural (e.g. clinic) institutions to be able to produce well-established diagnoses, that is, in order to perform the tacit integration of the symptoms, she submits her simple perception to a complex cultural knowledge-system.

So, our tacit knowledge is the achievement of a collective knowing process. Nevertheless, it is only *partly* true because we are a kind of intelligent animal that has certain tacit knowledge items rooted fundamentally in the *biological* levels (Polanyi 1962:69-77). This means on the one hand, that we also possess knowledge items that had emerged before our intellectual or social life started, and on the other hand, that our several knowledge items supersede the biological levels only by the influence of our higher level cultural knowledge. Thus, is our tacit knowledge the achievement of an *emergent evolutionary knowing process*? And afterwards is it the achievement of a collective knowing process? To the first question, the answer can be affirmative if we accept that the emergent evolutionary process during which the biologically rooted tacit knowledge continuously cumulates by the “continuous proliferation of germ plasm” (Polanyi 1962:386) is a kind of knowing process itself. We can accept even more easily that the answer to the second question is also positive, that is, our tacit knowledge is the achievement of a collective knowing process. However, in Polanyi’s view these two processes are only the two fundamental stages of the same emergent evolutionary process, namely the stages of biological and of cultural evolution (Polanyi 1962:385-90; Paksi 2010a). This is the reason why I assert that, according to Polanyi, the human tacit knowledge is the achievement of an emergent evolutionary knowing process of the generations of our phylogenesis. The evolutionary epistemology of tacit knowing *precedes* the actual ontology of tacit knowledge. By this knowing process our human knowledge and human *being* emerges. At the same time, this also means that this evolutionary epistemology is *also* an ontology. So, I believe in accordance with Polanyi, that neither tacit knowledge precedes tacit knowing nor tacit knowing precedes tacit knowledge, but in fact, the two are *inseparably interwoven*.

#### ACKNOWLEDGEMENT

The research was supported by the grant TÁMOP - 4.2.2.B-10/1--2010-0009, OTKA PD 83589, and OTKA K 84145.

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